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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/405,237	09/23/1999	JOHN K. RENWICK	IBN-0014	9267

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EXAMINER
MOLINARI, MICHAEL J

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 10/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

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	Application No.	Applicant(s)
Office Action Summary	09/405,237	RENWICK ET AL.
	Examiner	Art Unit	
	Michael J Molinari	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE **3** MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2002* .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10, 12-25, and 29-30* is/are rejected.

7)☒ Claim(s) *11-15 and 26-28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)   4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5) ☐ Notice of Informal Patent Application (PTO-152)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5* .   6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

2.   Claims 1-8, 10, and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Rekhter et al. ("Tag Switching Architecture") in view of Davie et al. ("Explicit Route Support in

MPLS"), further in view of Semeria ("Multiprotocol Label Switching: Enhancing Routing in the

New Public Network").

1.   Referring to claim 1, Rekhter et al. disclose a method of forwarding data over a network

from a source node to a destination node, comprising: providing a subnetwork (domain, see page

4, column 1, lines 30-31) within the network having a plurality of subnetwork nodes (switches,

see page 2, column 1, lines 14-16) connected by a plurality of subnetwork links (see page 5,

column 1, lines 22-24), the subnetwork nodes including an ingress node (see page 4, column 2,

lines 13-16) and an egress node (see page 4, column 2, lines 16-21) coupled to the source node

and the destination node, respectively, at least one pair of subnetwork nodes being connected by

a plurality of subnetwork links, the plurality of subnetwork nodes and the plurality of

subnetwork links defining a plurality of subnetwork paths (routes, see page 2, column 2, lines

29-30) between the ingress node and the egress node. Rekhter et al. disclose the use of explicit

routes in MPLS but differ from claim 1 in that they do not teach the details of how explicit routes in MPLS work. However, the use of explicit routes in MPLS is well known in the art. For example, Davie et al. disclose forwarding a signal (RSVP path message, see page 3, lines 24-25) from the ingress node (first node, see page 3, lines 18-20) to the egress node (last node, see page 3, lines 18-20) along a route through a subset of subnetwork nodes (the subset of subnetwork nodes is made up of the nodes of the ER-LSP, see page 3, lines 32-36) between the ingress node and the egress node, said signal requesting a response from each node along the route (see page 3, lines 33-34); and receiving response signals from the nodes along the route (the response signals are contained within the RESV message, see page 3, lines 37-40 and page 4, lines 1-6), the response signals defining a path within the route between the ingress node and the egress node as being how explicit routing works in a tag switching (MPLS) network. One skilled in the art would have recognized the advantage of explicit routes as taught by Davie et al. Therefore, it would have been obvious to a person with ordinary skill in the art at the time of the invention to incorporate the implementation of explicit routes in MPLS as taught by Davie et al. into the MPLS method of Rekhter et al. to achieve the advantage of implementing explicit routes (which have the advantage of enabling ISPs to have greater control over QoS in their networks). Rekhter et al. in view of Davie et al. differ from claim 1 in that they fail to disclose the creation of multiple paths between the ingress node and the egress node. However, this is also well known in the art. For example, Semeria teaches the provision of multiple LSPs between each pair of edge LSRs (see page 16, lines 23-26), which has the advantage of providing better QoS in the network. One skilled in the art would have recognized the advantage of provisioning multiple LSPs between each pair of edge LSRs as taught by Semeria. Therefore, it would have

been obvious to a person with ordinary skill in the art at the time of the invention to incorporate

the use of multiple LSPs between each pair of LSRs as taught by Semeria into the invention of

Rekhter et al. in view of Davie et al. to achieve the advantage of providing better QoS in the

network.

2.   Referring to claim 2, Rekhter et al. disclose that the network comprises a label-switching

(label-swapping) network (see page 1, column 2, lines 19-22).

3.   Referring to claim 3, Rekhter et al. disclose that the network comprises nodes (switches)

which forward data using Internet protocol node addresses (see page 1, column 2, lines 4-9 and

page 3, column 1, lines 8-12).

4.   Referring to claim 4, Davie et al. disclose that each subnetwork node along the route

allocates a plurality of labels for the plurality of paths along the route (see page 3, lines 39-40

and page 4, lines 1-2. Note that each path has its own label. Therefore, a plurality of paths

inherently includes a plurality of labels).

5.   Referring to claim 5, the examiner takes official notice that coupling an ingress node (or

border node) to a plurality of source nodes is old and well known in the art. Davie et al. disclose

that each source node coupled to the ingress node is associated with one of the plurality of paths

along the route between the ingress node and the egress node (see page 2, lines 36-38 and page 3,

lines 1-4).

6.   Referring to claim 6, the examiner takes official notice that coupling an egress node (or

border node) to a plurality of destination nodes is old and well known in the art. Davie et al.

disclose that each destination node coupled to the egress node is associated with one of the

plurality of paths along the route between the ingress node and the egress node (see page 2, lines 36-38 and page 3, lines 1-4).

7.   Referring to claim 7, Rekhter et al. discloses associating each packet of data to be transferred from a particular source node to a particular destination node with one of the plurality of paths between the ingress node and the egress node (see page 2, lines 13-32).

8.   Referring to claim 8, Rekhter et al. disclose performing a logical operation on information carried in each packet of data (see page 2, column 1, lines 13-26).

9.   Referring to claim 10, Semeria discloses that the logical operation is performed on an address field in the packet of data (see page 4, lines 21-26).

10.   Referring to claim 16, the examiner takes official notice that coupling an ingress node (or border node) to a plurality of source nodes is old and well known in the art. Davie et al. disclose that each source node coupled to the ingress node is associated with one of the plurality of paths along the route between the ingress node and the egress node (see page 2, lines 36-38 and page 3, lines 1-4).

11.   Referring to claim 17, the examiner takes official notice that coupling an egress node (or border node) to a plurality of destination nodes is old and well known in the art. Davie et al. disclose that each destination node coupled to the egress node is associated with one of the plurality of paths along the route between the ingress node and the egress node (see page 2, lines 36-38 and page 3, lines 1-4).

12.   Referring to claim 18, Semeria discloses the use of multiple paths between the ingress node and the egress node for the purpose of providing multiple levels of QoS. Some or all of the

LSPs, as disclosed by Semeria, could share a subnetwork link between a pair of subnetwork
nodes.

13.   Referring to claim 19, Rekhter et al. disclose that a plurality of subnetwork links

connecting the at least one pair of subnetwork nodes form a single logical link used in

forwarding the data from the ingress node to the egress node. This functionality is described

under the heading "Hierarchy of Routing Knowledge", page 4, column 1, lines 28-48 and

column 2, lines 1-30. Note that traversing a subdomain, as described by Rekhter et al., includes

traversing multiple physical links, but appears to the upper domain as a single logical link.

14.   Referring to claim 20, Rekhter et al. disclose an apparatus for forwarding data over a

network from a source node to a destination node, comprising: a subnetwork (domain, see page

4, column 1, lines 30-31) within the network having a plurality of subnetwork nodes (switches,

see page 2, column 1, lines 14-16) connected by a plurality of subnetwork links (see page 5,

column 1, lines 22-24), the subnetwork nodes including an ingress node (see page 4, column 2,

lines 13-16) and an egress node (see page 4, column 2, lines 16-21) coupled to the source node

and the destination node, respectively, at least one pair of subnetwork nodes being connected by

a plurality of subnetwork links, the plurality of subnetwork nodes and the plurality of

subnetwork links defining a plurality of subnetwork paths (routes, see page 2, column 2, lines

29-30) between the ingress node and the egress node. Rekhter et al. disclose the use of explicit

routes in MPLS but differ from claim 20 in that they do not teach the details of how explicit

routes in MPLS work. However, the use of explicit routes in MPLS is well known in the art.

For example, Davie et al. disclose a communication subsystem within the subnetwork for (i)

forwarding a signal (RSVP path message, see page 3, lines 24-25) from the ingress node to the

egress node along a route through a subset of subnetwork nodes (the subset of network nodes is

made up of the nodes of the ER-LSP, see page 3, lines 32-36) between the ingress node (first

node, see page 3, lines 18-20) and the egress node (last node, see page 3, lines 18-20), said signal

requesting a response from each node along the route (see page 3, lines 33-34), and (ii)

forwarding response signals from the subnetwork nodes along the route (the response signals are

contained within the RESV message, see page 3, lines 37-40 and page 4, lines 1-6), the response

signals defining a path within the route between the ingress node and the egress node as being

how explicit routing works in a tag switching (MPLS) network. One skilled in the art would

have recognized the advantage of explicit routes as taught by Davie et al. Therefore, it would

have been obvious to a person with ordinary skill in the art at the time of the invention to

incorporate the implementation of explicit routes in MPLS as taught by Davie et al. into the

MPLS method of Rekhter et al. to achieve the advantage of implementing explicit routes (which

have the advantage of enabling ISPs to have greater control over QoS in their networks).

Rekhter et al. in view of Davie et al. differ from claim 20 in that they fail to disclose the creation

of multiple paths between the ingress node and the egress node. However, this is also well

known in the art. For example, Semeria teaches the provision of multiple LSPs between each

pair of edge LSRs (see page 16, lines 23-26), which has the advantage of providing better QoS in

the network. One skilled in the art would have recognized the advantage of provisioning

multiple LSPs between each pair of edge LSRs as taught by Semeria. Therefore, it would have

been obvious to a person with ordinary skill in the art at the time of the invention to incorporate

the use of multiple LSPs between each pair of LSRs as taught by Semeria into the invention of

Rekhter et al. in view of Davie et al. to achieve the advantage of providing better QoS in the network.

15.   Referring to claim 21, Rekhter et al. disclose that the network comprises a label-switching (label-swapping) network (see page 1, column 2, lines 19-22).

16.   Referring to claim 22, Rekhter et al. disclose that the network comprises nodes (switches) which forward data using Internet protocol node addresses (see page 1, column 2, lines 4-9 and page 3, column 1, lines 8-12).

17.   Referring to claim 23, Davie et al. disclose that each subnetwork node along the route allocates a plurality of labels for the plurality of paths along the route (see page 3, lines 39-40 and page 4, lines 1-2. Note that each path has its own label. Therefore, a plurality of paths inherently includes a plurality of labels).

18.   Referring to claim 24, the examiner takes official notice that coupling an ingress node (or border node) to a plurality of source nodes is old and well known in the art. Davie et al. disclose that each source node coupled to the ingress node is associated with one of the plurality of paths along the route between the ingress node and the egress node (see page 2, lines 36-38 and page 3, lines 1-4).

19.   Referring to claim 25, the examiner takes official notice that coupling an egress node (or border node) to a plurality of destination nodes is old and well known in the art. Davie et al. disclose that each destination node coupled to the egress node is associated with one of the plurality of paths along the route between the ingress node and the egress node (see page 2, lines 36-38 and page 3, lines 1-4).

20.   Referring to claim 29, Semeria discloses the use of multiple paths between the ingress

node and the egress node for the purpose of providing multiple levels of QoS. Some or all of the

LSPs, as disclosed by Semeria, could share a subnetwork link between a pair of subnetwork

nodes.

21.   Referring to claim 30, Rekhter et al. disclose that a plurality of subnetwork links

connecting the at least one pair of subnetwork nodes form a single logical link used in

forwarding the data from the ingress node to the egress node. This functionality is described

under the heading "Hierarchy of Routing Knowledge", page 4, column 1, lines 28-48 and

column 2, lines 1-30. Note that traversing a subdomain, as described by Rekhter et al., includes

traversing multiple physical links, but appears to the upper domain as a single logical link.

22.   Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rekhter et al.

("Tag Switching Architecture") in view of Davie et al. ("Explicit Route Support in MPLS"),

further in view of Semeria ("Multiprotocol Label Switching: Enhancing Routing in the New

Public Network") as applied to claim 8 above, and further in view of Woodcock et al.

("Microsoft Press Computer Dictionary").

23.   Referring to claim 9, Rekhter et al. disclose the method of claim 8 above, but fail to

disclose that the logical operation comprises a hash function. However, the use of hash functions

in accessing tables of data (such as routing tables) is well known in the art. For example,

Woodcock et al. teach the use of hashing to find an element in a list, which has the advantage of

being highly efficient. One skilled in the art would have recognized the advantage of hashing as

taught by Woodcock et al. Therefore, it would have been obvious to a person with ordinary skill

in the art at the time of the invention to incorporate the use of hashing as taught by Woodcock et

al. into the invention of Rekhter et al. in view of Davie et al., further in view of Semeria to achieve the advantage of making the TIB table lookups highly efficient.

Allowable Subject Matter

24.   Claims 11-15 and 26-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

25.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

26.   U.S. Patent No. 6,081,511 to Carr et al. teaches a method of setting up redundant links between a source node and a destination node.

27.   U.S. Patent No. 6,374,303 to Armitage et al. teaches a method of requesting and receiving link state updates from neighbors in a network.

28.   U.S. Patent No. 6,275,492 to Zhang teaches a method of routing packets through a network using labels to identify specific routers.

29.   U.S. Patent No. 6,339,595 to Rekhter et al. teaches a method of implementing MPLS in a network.

30.   U.S. Patent No. 6,341,127 to Katsube et al. teaches a method of controlling setup of label switched paths in an MPLS network.

31.   U.S. Patent Application Publication No. US 2002/0110119 A1 to Fredette et al. teaches a method of stream aggregation in an MPLS network.
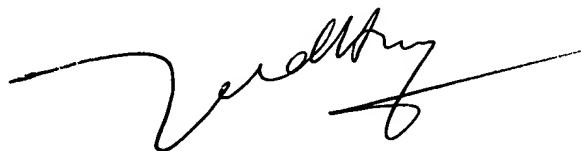
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Molinari whose telephone number is (703) 305-5742. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (703) 308-6602. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9315 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Michael Joseph Molinari
October 4, 2002

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